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Intra-oral fixation of the endotracheal tube in a major paediatric burns patient – An interdisciplinary solution

Secure fixation of the endotracheal tube (ETT) is of critical importance in burn patients, particularly those who are severely ill following burns to the head and neck. Securing the ETT safely and without secondary morbidity whilst maintaining adjustability is difficult in this cohort. Interdisciplinary team involvement can provide valuable and fresh perspectives in clinical problem solving.

This issue was highlighted in the case of a 9 year old male, retrieved from the country having sustained a 91% TBSA flame burn involving his torso, circumferential neck and face. Initial intubation was challenging and predicted success at re-intubation, if required, was low. A prolonged period of intubation was predicted. Conventional methods

of fixation such as adhesive tapes are impractical in such patients, requiring areas of unburnt peri-oral skin for the tape to adhere to. (Image 1). A circumferential fabric tie



Image 1 (right): Lack of available skin for tape fixation

around the neck was initially used but with large fluctuations in swelling due to burn injury and fluid resuscitation this was often found to be either too tight or too loose, requiring regular adjustment. In addition, both of these conventional methods are surgically inconvenient when debriding and grafting the facial burns. Following case discussions regarding airway management between the



Image 2: An impression of the patient’s upper dentition was taken on Day 3

Anaesthetists and Burns Surgeons, input was sought from the Dental Department for management of loose dentition, maintenance of oral health and a potential solution to ETT fixation. The ‘wish-list’ of features an ideal solution would contain was:

- High security of fixation despite fluid shifts
- No negative impact on re-intubation if required
- Ability to move head and jaw
- Full access to perioral tissue for grafting
- Simplicity of design and use

The Dental department designed and fabricated a custom maxillary splint within 48 hours that addressed the shortcomings of other methods. The splint was fitted and cemented in place (GC Fuji ORTHO™) during the next planned dressing change (Images 2-4). The ETT was tied-in with a silk

suture to the anteriorly projecting plate. Additional taping was used to further secure the tube (Image 5). Bite blocks were incorporated to protect the ETT from being damaged by the

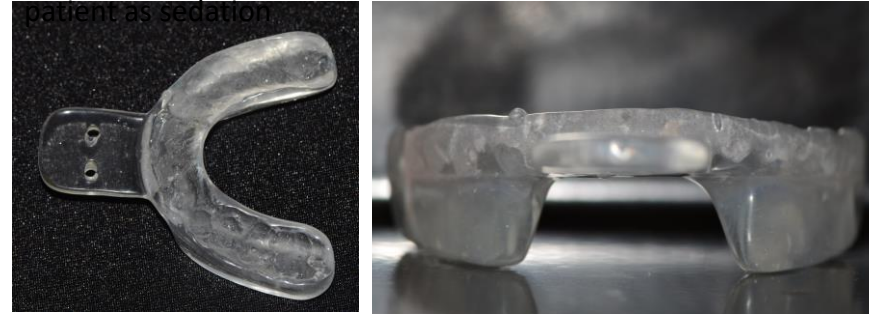
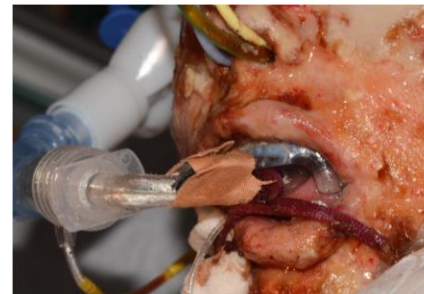


Image 3 (left) and 4 (right): Finished product. Superior and anterior views (respectively)

patient as sedation was progressively lightened. The distance between the bite blocks was sufficient to allow a laryngoscope blade to be inserted in the event of extubation. The ETT remained secure for 45 days, it was removed during planned extubation. The device enabled unimpeded surgical and nursing care to the face throughout this time. We thank our dental colleagues for their



input and acknowledge the importance of utilising a multidisciplinary team approach in the provision of high quality care to complex patients.

Image 5 (left): Maxillary splint in situ prior to tie removal